

**From:** [Stuble, Bill](#)  
**To:** [Thomas, Laurent](#)  
**Cc:** [Potter, Dolly](#); [Vandendoren, Alain](#)  
**Subject:** RE: Calciner model  
**Date:** Wednesday, June 23, 2004 11:24:32 AM

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**From:** Stuble, Bill  
**Sent:** Wednesday, June 23, 2004 11:04 AM  
**To:** Thomas, Laurent  
**Cc:** Potter, Dolly; Vandendoren, Alain  
**Subject:** RE: Calciner model

Hello Thomas,

Sounds like excellent progress.

Yes, for this material and energy balance it should be ok to assume constant pressure throughout the system and get a good estimate of ACFM. Pressures vary from -0.1" water column in the furnace to -12" water column at the inlet of the fan. This would introduce up to 3.6% error in ACFM, depending on location, which is in the same ballpark as the effect of drastic change in atmospheric pressure.

There may be one more component to add to the calciner exhaust. Calcination / heating of trona (in the feed section, we think) results in organics partially combusting to CO. We have seen up to 2000 ppm CO in the calciner offgas, and some of this CO will be recirculated to the furnace in the FGR. Detroit Stoker (through Reaction Engineering using Computational Fluid Dynamics) will be modeling the furnace one more time in great detail, using inputs from Calcinator. The CFD model will tell us how much of the recirculated CO is combusted in the lower portion of the furnace. This is important because CO affects the performance of the SNCR in the upper half of the furnace.

Will it be possible to add this CO production into the calciner model? It could be as simple as assuming X ppm carbon in the feed, and having it convert to Y CO.

I will be on vacation for the next seven days. Please copy Dolly and Alain on e-mails for the next seven days -- they can help answer any questions.

Thanks again, Bill

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**From:** Thomas, Laurent  
**Sent:** Wednesday, June 23, 2004 6:37 AM  
**To:** Stuble, Bill  
**Subject:** Calciner model

Hello Bill,

Philippe has introduced most of the modifications you asked for in the program. In particular, the excess air calculation now includes the oxygen in the FGR... so it is not called "excess air" any more, but

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"excess oxygen".

We just have a small worry for the ACFM flow : it depends on the pressure, so we should in theory introduce a pressure profile from the furnace to the stack.

However, I suppose we can just assume constant pressure, and we'll get a good estimate of the ACFM. Is this right (ie is it right to assume small variation of gas pressure) ?

laurent

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